

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. :

U.S. National Serial No. :

Filed :

PCT International Application No. : PCT/DE03/00067

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I hereby declare that all the statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application issued thereon.

Date: June 12, 2006

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Description

Method for anonymous identification of profiles of subscribers in a communications system, and a corresponding module

The present invention relates to a method for anonymous identification of profiles of subscribers in a communications system, in particular a wire-free communications system. When searching for specific offer and demand profiles, it is often desirable, on the one hand, to be able to make an anonymous selection from various profiles which are available for selection before making direct contact with a subscriber with a specific profile, but also, on the other hand, at the same time to have the capability to make immediate personal contact with a corresponding subscriber. Until now, it has been normal to oneself produce an offer or a demand by means of conventional media such as a print (advertisement), the Internet (for example by Webpage), mobile radio technologies, for example by means of questionnaires from providers. This offer was then compared manually, in a partially automated form or fully automatically with already stored offers and demands. This refers, for example, to the cognitive comparison of advertisements with the desired profile of the person carrying out the search, the use of search engines for searching the Internet, and the use of search robots. Until now, it has not been possible to make direct immediate contact with a specific subscriber in conjunction with an anonymous previous selection.

One object of the present invention was now to provide a method and a module by means of which it is possible for a subscriber in a communications system to easily, quickly and anonymously, identify, offer and demand profiles of other subscribers in the communications system, and, if required, to make contact with one or more subscribers immediately.

This object is achieved by a method according to the invention as claimed in claim 1, and/or by a module according to the invention as claimed in claim 8. Advantageous embodiments are described in the respective dependent claims.

According to claim 1, a method is provided for anonymous identification of profiles of subscribers in a communications system, in which

- a. the subscribers define and store subscriber-specific profiles via a respective input unit in a respective communication appliance and/or in a respective module (H, MA, MB) which is coupled to a respective communication appliance (E),
- b. profiles of other subscribers in the communications system are collected on the basis of a wire-free, locally restricted network technology by means of the respective module which is coupled to a respective one of the communication appliances, are compared with the profile which is defined and stored in the respective communication appliance, and are rejected or are signaled to the respective subscriber on the basis of a subscriber-specific correlation threshold,
- c. a communication connection is set up between subscribers whenever subscriber-end activation takes place, via an intermediate provider in the communications system.

In this case, by way of example, the input unit may be a keyboard or keypad of a mobile communication appliance, such as a mobile telephone, or a keyboard of a computer unit, such as a personal computer (PC). A further possibility is to input the profile on an external appliance, for example on a personal computer (PC) and to transmit the data to the communication appliance via a wire-free interface, in general via a radio interface or an infrared interface.

The module which is coupled to a communication appliance may be integrated in the communication appliance and may thus be a component of the communication appliance, or may be connected as an external module to the communication appliance in the form of a so-called plug-on module.

In one preferred embodiment, a LAN (local area network) and/or a PAN (personal area network) technology is used as the wire-free, locally limited network technology. It is particularly preferable to use Bluetooth technology in this case. The expression Bluetooth was introduced in a 1998 Specification by a Special Interest Group comprising experts from various companies, for a local data radio system. A transmission capacity of up to about 1 Mbit/s is offered to the subscribers in the communications system in a 2.4 GHz frequency band (ISM band), for which no licenses are required. The range is less than 100 m, and it is thus designed primarily for communication in a local area. Bluetooth technology is particularly highly suitable for the purposes of the invention, for the reasons stated in the following text:

1. Bluetooth technology has been standardized throughout the world, it costs little and represents a mass-produced product,
2. it can easily be integrated in communication appliances using a cellular mobile radio standard, such as GSM, GPRS, EDGE, UMTS,
3. low costs are incurred for use of a radio channel,
4. the range is deliberately restricted because, according to the invention, the aim is to make contact only with the appliances in the immediate vicinity.

IEEE 802.11b LAN technology can be used as an alternative to Bluetooth. Further wire-free technologies for Local and Personal Area Network applications are currently in the standardization phase.

The technology which is used is in this case preferably coupled to a mobile communication appliance (referred to in the following text as a cellular communication appliance) which operates in accordance with a cellular standard. A mobile communication appliance based on the GSM, GPRS, EDGE and/or UMTS standard is particularly preferred in this case.

For anonymous identification of matching offer and demand profiles in the immediate vicinity of the searching subscriber in the communications system, the searching subscriber uses, for example, a categorization and description rule to, for example, define an object offer, demand or interest profile, and advantageously store this in a suitable form in the module or communication appliance. By way of example, the nature of the offer or demand object or area of interest is described using the standardized categorization rule, and the object is itself described using the standardized, object-typical description rule. The definition of standardized rules provides the capability for successful correlations.

The module which is being used automatically makes use of a wire-free, locally limited network technology on an ad hoc basis to contact every other module which is located in the same radio cell as the searching subscriber himself. A direct, bidirectional connection is thus set up. After the identification of a further module in the corresponding radio cell of the subscriber, an ad hoc connection is set up to this module, and the profiles of the corresponding subscribers are then transmitted, advantageously bidirectionally, to the searching subscriber. After reception of the data, the profiles are correlated, advantageously in both modules that are involved.

In one preferred embodiment of the method according to the invention, each module of a subscriber is allocated an ID number. The so-called Bluetooth device address, which is

supported by the Bluetooth Standard, is automatically advantageously used as the ID number, and uniquely identifies every Bluetooth module throughout the world. By way of example, once the systems have first been switched on, the modules transmit their ID numbers via the preferably cellular communication appliances to the intermediate provider. The provider thus sets up a unique association between the ID number of the module and the address (telephone number) of the cellular communication appliance. This association is valid only provided that the module is not replaced. If a different module is connected to the communication appliance, the provider must carry out a new allocation process. The method mentioned above may be used for this purpose. The ID numbers are likewise transmitted bidirectionally, in order to identify the corresponding modules, while making contact between two respective modules.

A correlation threshold, which is defined in advance by the corresponding subscriber, decides on the basis of the correlation process whether two profiles should be assessed as matching sufficiently well. If this is the case, then the subscriber is informed in some suitable form, for example acoustically, of a positive correlation result. The information states that a partner or object of interest in terms of the offer and demand is located in the immediate vicinity. When using Bluetooth technology, this distance is generally less than 100 m.

For the purposes of the present invention, the following criteria are now important in order to finally make personal contact with the subscribers, that is to say to set up a direct communication connection:

- The network technology used means that it cannot and should not be assumed that there is any direct visual link, which would simplify the contact.

- Owing to the desire for discretion, it must not be absolutely essential to have to set up and identify a direct personal (visual) link. Furthermore, it must not be essential to have to set up the link immediately in time. It must also be possible to avoid personal details becoming known, such as a telephone number or address, in order to make direct contact.
- The subscriber has full flexibility to accept or reject a personal contact, with complete protection of his intimate environment.

If a direct communication connection is intended to be set up, then, according to the invention, this is done by a respective suitable activation process at the subscriber end. Such activation may be carried out, for example, by pushing a key on the module or on the communication appliance input unit. According to the invention, a communication connection, preferably a GSM, GPRS, EDGE or UMTS connection, is then first of all set up automatically to an intermediate provider in the communications system. This intermediate provider organizes the contact. By way of example, the contact may be organized as follows:

A module of a subscriber A transmits the ID number of a module of a subscriber B whom the subscriber A wishes to contact, with a contact request via the preferably cellular communication appliance to the intermediate provider. The subscriber B and the associated module can be identified uniquely by this ID number which is stored with the provider. The provider checks whether the module of the subscriber B or the subscriber B with which or whom subscriber A wishes to make contact, likewise in the framework of a time window to be defined, has notified any interest in making contact, once the ID number has likewise been transmitted to him or it together with a contact request. If this is not the case, then direct contact is impossible. Furthermore, in the case of an unsuccessful direct contact, the

provider can bill the subscriber A with a fee, depending on the tariff regulations.

If the subscriber B is likewise interested in making contact, then the subscriber B or the module of the subscriber B transmits the ID number of A together with a contact request, likewise via the preferably cellular communication appliance, to the provider. If both contact requests and the ID numbers of the modules occur within a defined time window, then the contact is successful. A neutral telephone number is in each case preferably assigned to the subscribers in order to set up a communication connection between the subscribers A and B. This provides the capability for both subscribers to make contact via neutral telephone numbers, which are not the same as the personal telephone numbers, in order to protect anonymity. The neutral telephone numbers are preferably assigned temporarily for a specific time window. By way of example, the provider may charge the subscribers A and B a fee for each successful contact, for example in the order of magnitude of a present-day SMS (short message service) transmission. Contact is thus successfully made. The subscribers A and B may now have a verbal discussion. Since the two subscribers are close to one another, immediate personal contact is also possible.

In a further application of the invention, one of the subscribers may be a stationary or mobile provider of a product or of a service. On the basis of the given description, the offer or the demand is communicated by means of the described technology to each subscriber passing by within a limited area. On the basis of the known terminology, this service may be referred to as a location based offer or location based services. In addition to information on the precisely described location, the provider of the service may (on confirmation of the interest by a potential customer) advantageously be sent further information, such as prices, via the communication

appliance. In contrast to the above application, the service provider advantageously automatically confirms the correlation.

One advantage of the present invention over already existing identification systems as mentioned initially is, inter alia, that a searching subscriber and a providing subscriber are located in the immediate vicinity of one another, so that it is possible for the two subscribers to make personal contact, possibly directly and spontaneously, if both are interested in so doing. If, for example, one subscriber is looking for a tennis partner in his immediate vicinity, with whom he also would now like to play a game of tennis, then the method according to the invention makes it possible for him to find out whether an appropriate tennis partner for him is located in his vicinity. If this is the case, that is to say a match can be found between an offer and a demand, then each of the two subscribers has reaction options, depending on the situation. A communication connection is set up only if both subscribers notify interest in making contact by subscriber-end activation. The two subscribers can thus contact one another spontaneously, easily and quickly. Until direct personal contact is made, the intimate environment is protected by not issuing the personal contact information, such as the telephone number and/or address. This is particularly important when using the method according to the invention when searching for friends and/or partners.

A further advantage of the present invention is that the process of searching for a matching profile in the immediate vicinity is carried out locally and continuously over time without the corresponding subscriber having to carry out any action repeatedly. This means that the search is carried out in parallel with another business activity. Furthermore, as already mentioned, the search is discreet and anonymous. It is not binding, and can be controlled on a personal basis.

The present invention also relates to a module which can be integrated in a mobile communication appliance and/or can be coupled via an interface to a mobile communication appliance, and which has at least the following elements:

- A. a memory unit for storage of profiles,
- B. a collecting unit, which operates on the basis of a wire-free, locally limited network technology, for collecting (scanning) profiles of subscribers in a communications system,
- C. a correlation unit for comparison of profiles with one another,
- D. a signaling/synchronization unit.

The components of the module described above may also become components of the communication appliance, as the degree of integration increases. Thus, for example, the memory unit may be integrated in the memory of the communication appliance, the function of the correlation unit may be carried out by the processor of the communication appliance, and the function of the signaling and synchronization unit may be carried out by additional hardware in the communication appliance. One characteristic feature of the module which is fully integrated in the communication appliance is the LAN/PAN technology and the specific software for controlling the additional functionality.

The mobile communication appliance preferably supports cellular communication standards, such as GSM, GPRS, EDGE or UMTS. The most important components of the communication appliance are the mobile radio hardware and software, with an interface for the module and for the input unit.

The collecting unit is preferably a unit which operates on the basis of LAN and/or PAN technology.

Furthermore, the memory unit is preferably a RAM.

The correlation unit is preferably a microcomputer. Furthermore, the signaling/synchronization unit is preferably a software-assisted circuit.

Further advantages of the invention will be explained in more detail with reference to the following figures, in which:

Figure 1 shows a schematic flowchart of one exemplary embodiment of the method according to the invention, and

Figure 2 shows a schematic illustration of one embodiment of a module according to the invention, which is integrated in a mobile communication appliance.

In order for a subscriber A to search for and identify a profile PA within a communications system, the subscriber A first of all enters in a module MA the profile PA defined and sought by him, and at the same time defines a correlation threshold KA. This correlation threshold KA determines the degree of match which should be present in the comparison of profiles of other subscribers with the profile PA of the subscriber A in order that the subscriber A will include the correspondingly different profile of another subscriber in a narrower selection. Another subscriber B in the communications system enters a profile PB which is defined and sought by him in a module MB and defines a correlation threshold KB. The ID numbers of the module MA of the subscriber A, referred to in the following text as ID-A, and of the module MB of the subscriber B, referred to as ID-B in the following text, are transmitted to a provider P, where they are stored. The provider thus has a unique association between the telephone number of the subscriber A and the ID number ID-A of MA, and the telephone number of the subscriber B and the ID number ID-B of MB. By means of connections which are in each case set up to other modules of other subscribers, the module MA uses LAN or

PAN technology to collect profiles of other subscribers in the immediate vicinity in the communications system. The module MB carries out the same procedure. In this case, inter alia, a connection A-B is also set up from the module MA to the module MB. The module MA sends the profile PA together with the ID number ID-A to the module MB, which receives the data. In the same way, the module MB sends the profile PB together with the corresponding ID number ID-B to the module MA. A correlation Corr of the two profiles PA and PB is in each case carried out, both in the module MA and in the module MB. If the respective correlation threshold KA or KB is reached in both modules, then both the subscriber A and the subscriber B have the capability to carry out appropriate activation, for example by pushing a button on the input unit of his module or the communication appliance, in order to express the wish to set up a communication connection. A GSM connection is then set up automatically to the communications system provider. If both subscribers express the wish for a communication connection within a fixed time window, then the provider allocates a temporary telephone number TB from the subscriber B to the subscriber A, and a temporary telephone number TA from the subscriber A to the subscriber B. These telephone numbers are allocated appropriately to the subscribers, such that the subscribers A and B can each make contact K with one another via these telephone numbers.

Figure 2 shows a module H which is integrated in a mobile communication appliance E. The mobile communication appliance E contains, as components, the radio hardware F and the software with an interface for the module H and the input unit G. The module H contains a memory unit A for storage of profiles, a collecting unit B, which operates on the basis of a wire-free, locally limited network technology, for collecting (scanning) profiles of subscribers in a communications system, a correlation unit C for comparison of profiles with one another, and a signaling/synchronization unit D.

Patent claims

1. A method for anonymous identification of profiles (PA, PB) of subscribers (A, B) in a communications system, in which
 - a. the subscribers (A, B) define and store subscriber-specific profiles (PA, PB) via a respective input unit (G) in a respective communication appliance (E) and/or in a respective module (H, MA, MB) which is coupled to a respective communication appliance (E),
 - b. profiles (PB, PA) of other subscribers (B, A) in the communications system are collected on the basis of a wire-free, locally restricted network technology by means of the respective module (H, MA, MB) which is coupled to a respective one of the communication appliances (E), are compared with the profile (PA, PB) which is defined and stored in the respective communication appliance (E), and are rejected or are signaled to the respective subscriber (A, B) on the basis of a subscriber-specific correlation threshold (KA, KB),
 - c. a communication connection is set up between subscribers (A, B) whenever subscriber-end activation takes place, via an intermediate provider (P) in the communications system.
2. The method as claimed in claim 1, characterized in that a LAN (local area network) and/or a PAN (personal area network) technology, in particular Bluetooth, is used as the wire-free, locally limited network technology.
3. The method as claimed in claim 1 or 2, characterized in that a respective mobile communication appliance, which operates in accordance with a standard, is used as the

respective communication appliance (E), with the standard being from a group comprising: GSM, GPRS, EDGE and UMTS.

4. The method as claimed in one of claims 1 to 3, characterized in that each module (H, MA, MB) of a subscriber (A, B) is allocated an ID number (ID-A, ID-B).

5. The method as claimed in one of the preceding claims, characterized in that a computer is used as the input unit (G).

6. The method as claimed in one of the preceding claims, characterized in that, in step c., the respective subscribers (A, B) are assigned a respective neutral telephone number (TA, TB) in order to set up a communication connection between subscribers (A,B).

7. The method as claimed in claim 6, characterized in that the neutral telephone numbers (TA, TB) are assigned temporarily.

8. A module (H, MA, MB) which can be integrated in a mobile communication appliance (E) and/or can be coupled via an interface to a mobile communication appliance (E) and has at least the following elements:

- A. a memory unit (A) for storage of profiles,
- B. a collecting unit (B), which operates on the basis of a wire-free, locally limited network technology, for collecting (scanning) profiles (PA, PB) of subscribers (A, B) in a communications system,
- C. a correlation unit (C) for comparison of profiles (PA, PB) with one another,
- D. a signaling/synchronization unit (D).

9. The module as claimed in claim 8,
characterized
in that the collecting unit (B) is a unit which operates on the
basis of LAN and/or PAN technology.

10. The module as claimed in claim 8 or 9,
characterized
in that the memory unit (A) is a RAM.

11. The module as claimed in one of claims 8 to 10,
characterized
in that the correlation unit (C) is a microcomputer.

12. The module as claimed in one of claims 8 to 11,
characterized
in that the signaling/synchronization unit (D) is a
software-assisted circuit.

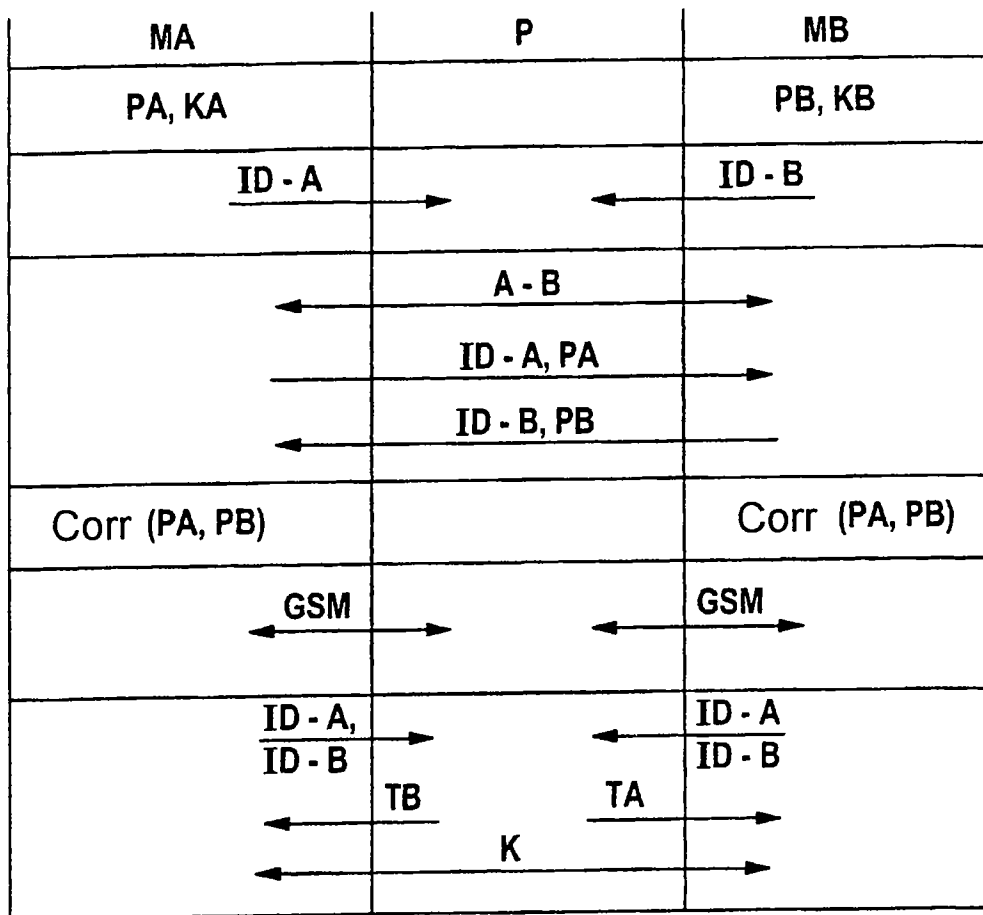


FIG 1

